

TIMING MISALIGNMENT ESTIMATION

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ABSTRACT

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Orthogonal frequency division multiplexing (OFDM) receiver embodiments of the invention provide timing misalignment estimation by calculating the intra-baud timing differential. The preferred method exploits the spectral structure of the short-preamble in that a time delay in the time-domain is manifest as a phase rotation in the frequency-domain. The timing misalignment is determined by special processing the spectral peaks of the modified short-preamble. An alternative embodiment linearly combines the two long-preamble symbols to construct a single "best estimate" long-preamble symbol. A normalized dot product of the "best estimate" long-preamble symbol and the ideal on-baud symbol is computed to obtain the magnitude of the timing misalignment. A dot product between the "best estimate" long-preamble symbol and the time derivative of the ideal on-baud sampled sequence is computed to obtain the sign of the timing misalignment.